ESRF	**Experiment title:** Structural Studies of Core-Shell Heterostructured Dilute Magnetic Semiconductor Nanocables	**Experiment number**: CH-2349
Beamline:	**Date of experiment**: from: 24/01/2007 to: 30/01/2007	**Date of report**: 27/02/2009
Shifts:	**Local contact(s)**: Dr Sergey Nikitenko	*Received at ESRF:*

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Dr Justin D. Holmes

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Report:

The following papers contain data collected at the ESRF as a result of this beam time application.

Machteld I. van der Meulen, Nikolay Petkov, Michael A. Morris, Olga Kazakova,§ Xinhai Han, Kang L. Wang, Ajey P. Jacob, Justin D. Holmes 'Single Crystalline Ge1-*x*Mn*x* Nanowires as Building Blocks for Nanoelectronics', *Nano. Lett.*, **2009**, *9(1)*, 50.

Abstract: Magnetically doped Si and Ge nanowires have potential application in future nanowire spin-based devices. Here, we report a supercritical fluid method for producing single crystalline Mn-doped Ge nanowires with a Mn-doping concentration of between 0.5-1.0 atomic % that display ferromagnetism above 300 K and a superior performance with respect to the hole mobility of around 340 cm2/Vs, demonstrating the potential of using these nanowires as building blocks for electronic devices.

Donna C. Arnold, Olga Kazakova, Guillaume Audoit, Joseph M. Tobin, Jaideep S. Kulkarni, Sergey Nikitenko, Michael A. Morris, Justin D. Holmes, 'The Synthesis and Characterisation of Ferromagnetic $CaMn_2O_4$ Nanowires', *Chem. Phys. Chem.*, **2007**, *8*, 1694.

Abstract: The synthesis of marokite $CaMn_2O_4$ nanowires using a hydrothermal method is reported. Transmission electron microscopy and electron diffraction measurements show that the nanowires are polycrystalline in nature with diameters between 10 and 20 nm and lengths ranging from approximately 100 to 500 nm. Most interestingly, in contrast with the bulk material, magnetization measurements show that these nanowires exhibit ferromagnetic ordering with a Curie temperature (TC) of approximately 40 K.